Analog Electronics

ETB-7101 USER'S GUIDE 595-6113-1

Analog Electronics, Workbook
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Introduction

The EB-7101-60 parts pack consists of two circuit boards which are designed to be used with the EB-7101-40 Workbook. Twenty-six exercise blocks are configured on the two circuit boards. Also included in the parts pack are jumper wires needed to interconnect the circuitry on the circuit boards, two test leads, and a multimeter.

The first board contains the circuits for Exercises 1 through 13. The second board contains the circuits for Exercises 14 through 26. Each of these boards contain handy test point pins which are interconnected to the required power supply, generator, and potentiometer terminal blocks on the ETW-7000 Trainer.

Circuit Board Pictorials

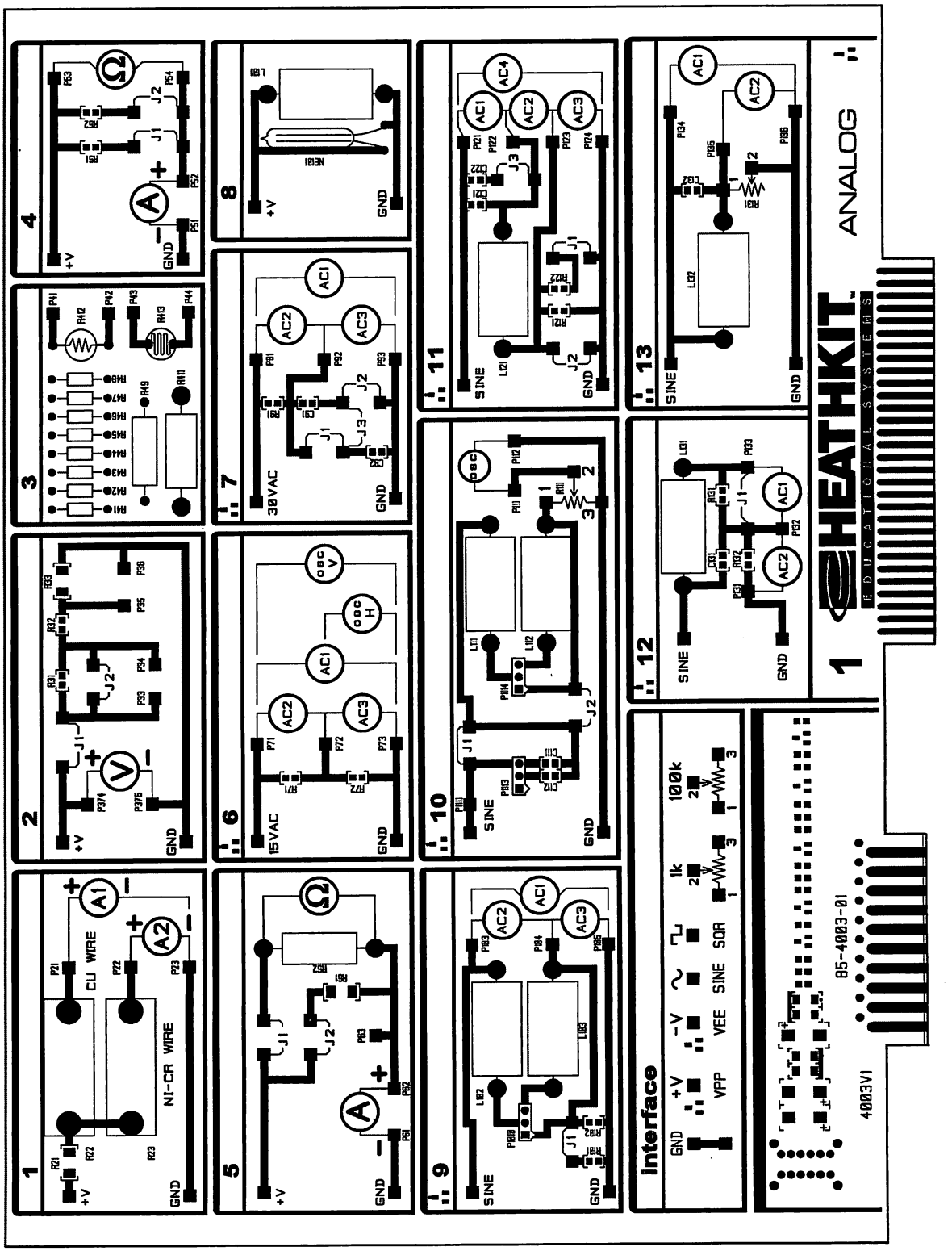


Figure 1
Circuit Board #1.

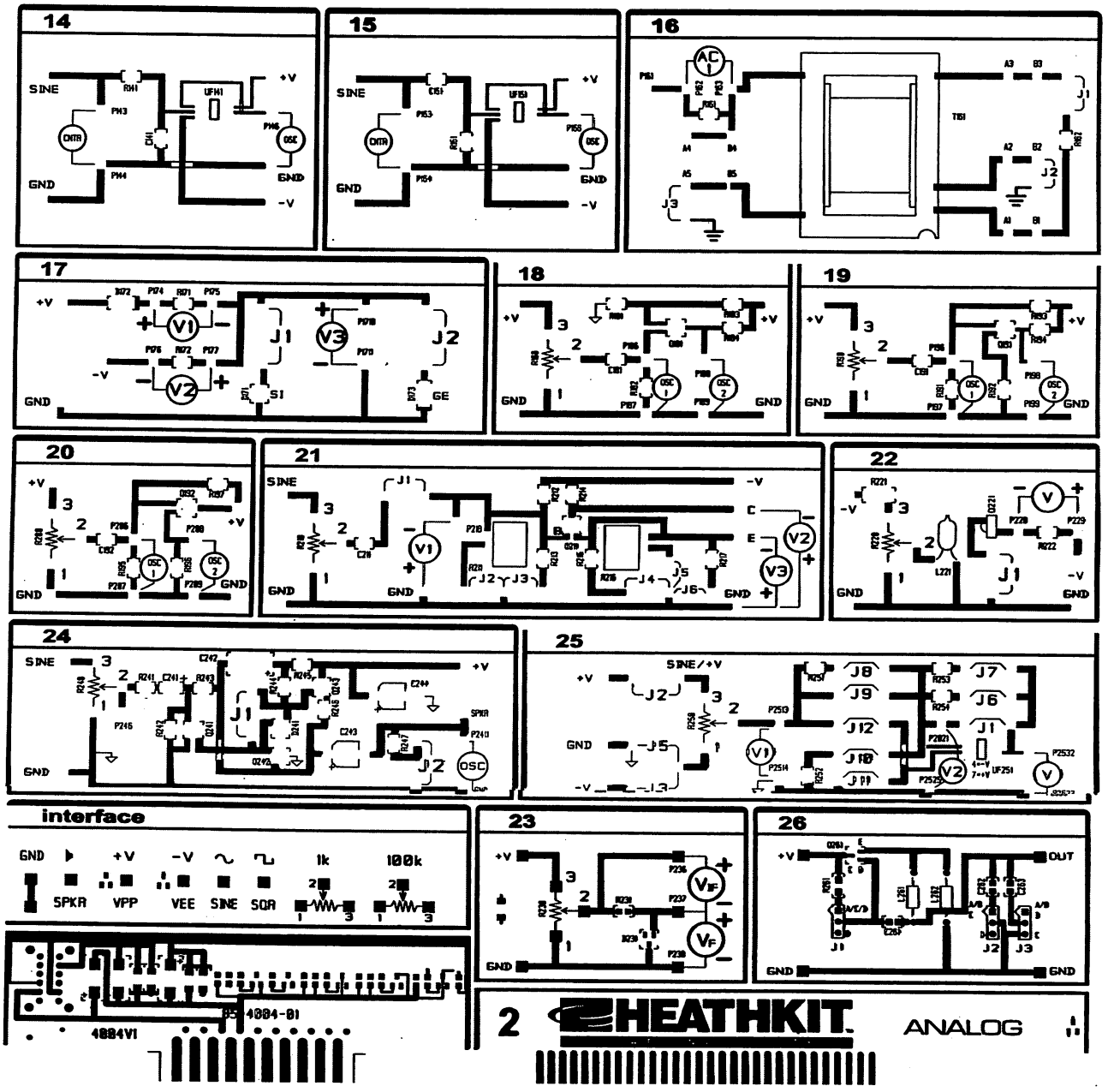


Figure 2
Circuit Board #2.

Replacement Parts List

NOTE: This parts list shows only those parts that we consider to be field replaceable. Any circuit boards that require replacement of a surface-mount part should be returned to the Heathkit Company for service.

Exercise Board #1

Component No.	Description	Part No.
L101	Inductor	40-2137
L102	Inductor	40-2137
L103	Inductor	40-2137
L111	Inductor	40-2137
L112	Inductor	40-2137
L121	Inductor	40-2137
L131	Inductor	40-2137
L132	Inductor	40-2137
NE101	Neon lamp	412-15
P1010	3-pin plug	432-1102
P1113	3-pin plug	432-1102
P1114	3-pin plug	432-1102
R22	Copper wire assembly	100-2064
R22	Nichrome wire assembly	100-2065
R41	4.7 Ω, ¼-watt resistor	6-479-12
R42	10 Ω, ¼-watt resistor	6-100-12
R43	100 Ω, ¼-watt resistor	6-101-12
R44	390 Ω, ¼-watt resistor	6-391-12
R45	8200 Ω, ¼-watt resistor	6-822-12
R46	56 kΩ, ¼-watt resistor	6-563-12
R47	330 kΩ, ¼-watt resistor	6-334-12
R48	1 MΩ, ¼-watt resistor	6-105-12
R49	100 Ω, 1-watt resistor	6-101-1
R411	100 Ω, 2-watt resistor	6-101-2
R412	120 Ω thermistor	9-34
R413	LDR	9-83
R62	100 Ω, 2-watt, 5% resistor	6-101-2
	Slide switch (power)	60-688
	Jumper block	432-1041
	Test point terminal	432-2020

Exercise Board #2

Component No.	Description	Part No.
D174	1N4002 Diode	57-65
J1	3-pin plug	432-1102
J2	3-pin plug	432-1102
J3	3-pin plug	432-1102
L221	Lamp	412-601
L261	330 µH choke	45-661
L262	47 µH choke	40-1659
R211	1000 Ω potentiometer	10-1141
R216	200 Ω potentiometer	10-1155
R255	2000 Ω, ¼-watt resistor	6-202-12
R256	2000 Ω, ¼-watt resistor	6-202-12
R257	1 MΩ, ¼-watt resistor	6-105-12
T161	Transformer	51-217
Q221	Transistor	417-1027
	Slide switch (power)	60-688
	Jumper block	432-1041
	Test point terminal	432-2020

Miscellaneous

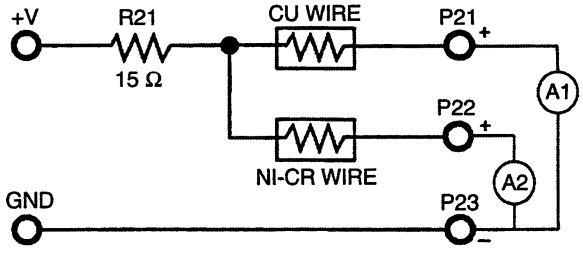
Component No.	Description	Part No.
	Storage box	95-713
	Storage divider	95-711
	12-inch blue jumper wire	134-3966
	12-inch orange jumper wire	134-3967
	12-inch black jumper wire	134-3968
	12-inch red jumper wire	134-3969
	12-inch green jumper wire	134-3970
	4-inch white jumper wire	134-3971
	12-inch yellow jumper wire	134-3974
	19-inch violet jumper wire	134-3991
	Red test lead	347-7
	Black test lead	347-8

Schematic Diagrams

NOTES:

1. Refer to the "Circuit Board Pictorials" for the physical locations of the parts.
2. All resistor values are in ohms (k = 1000, M = 1,000,000).
3. All capacitor values are in microfarads (µF).
4. ⏚ Indicates a ground connection.

Exercise Board #1



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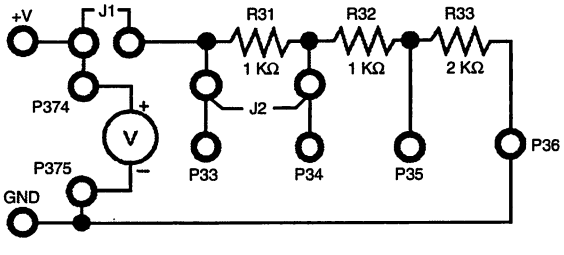

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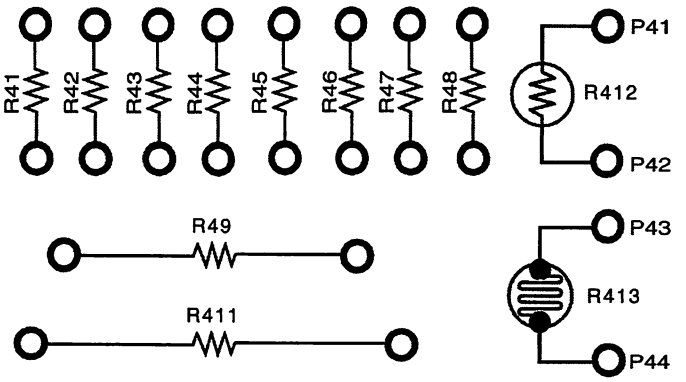

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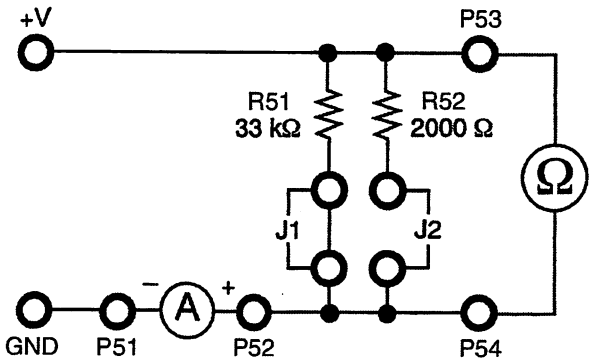

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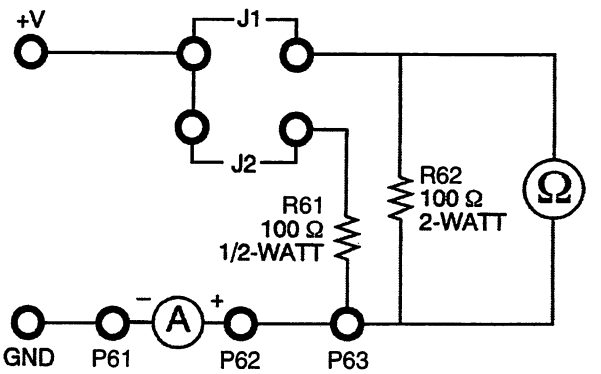

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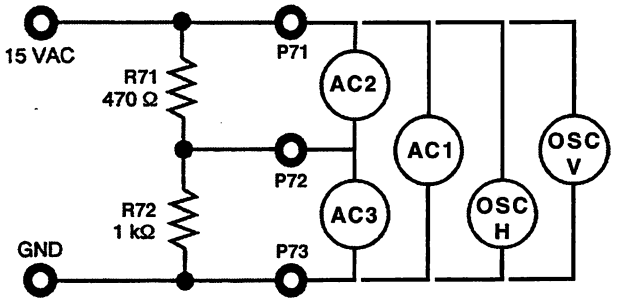

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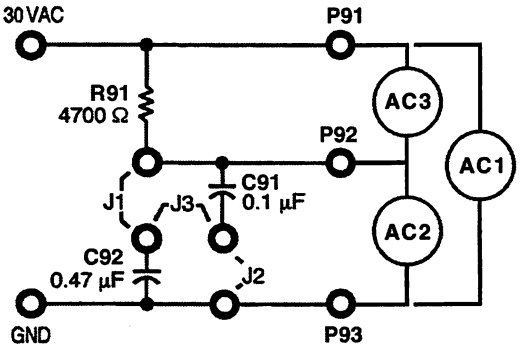

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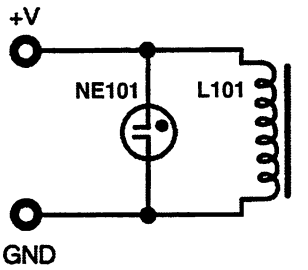

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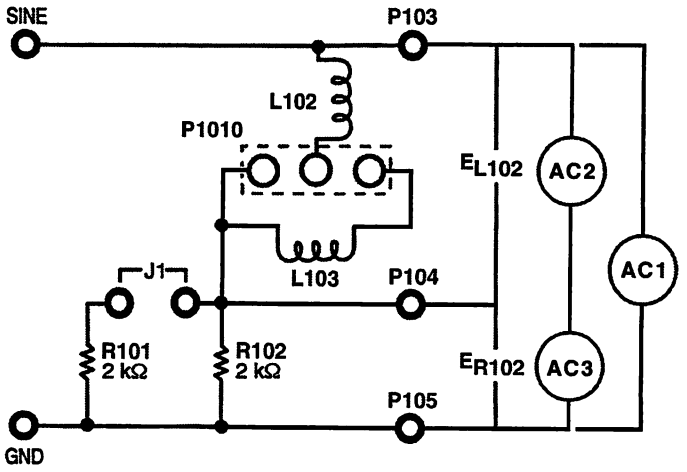

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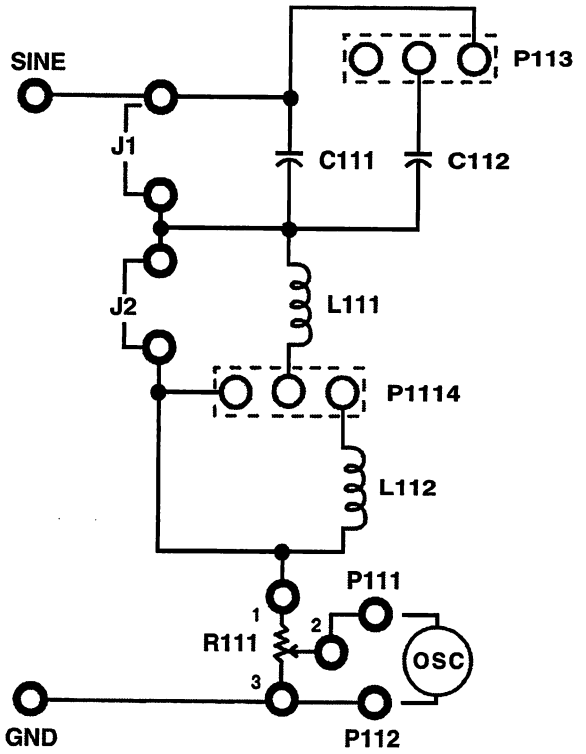

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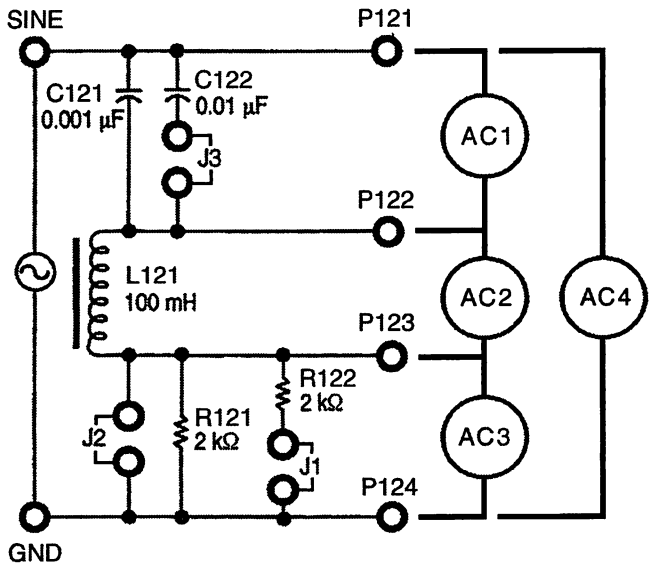

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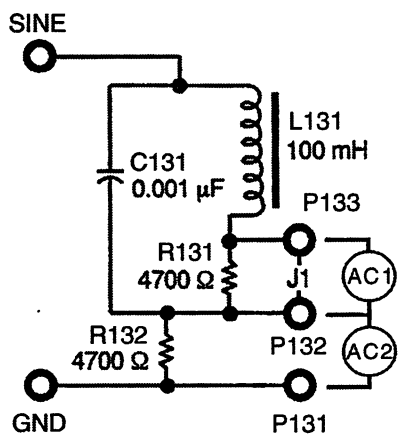

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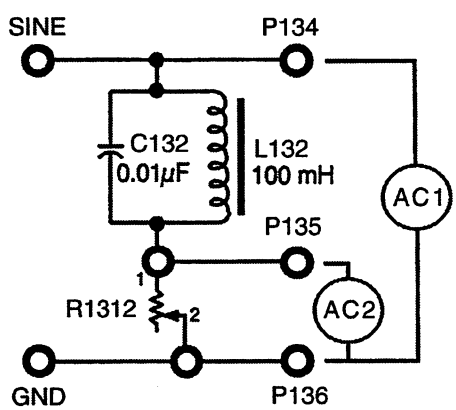

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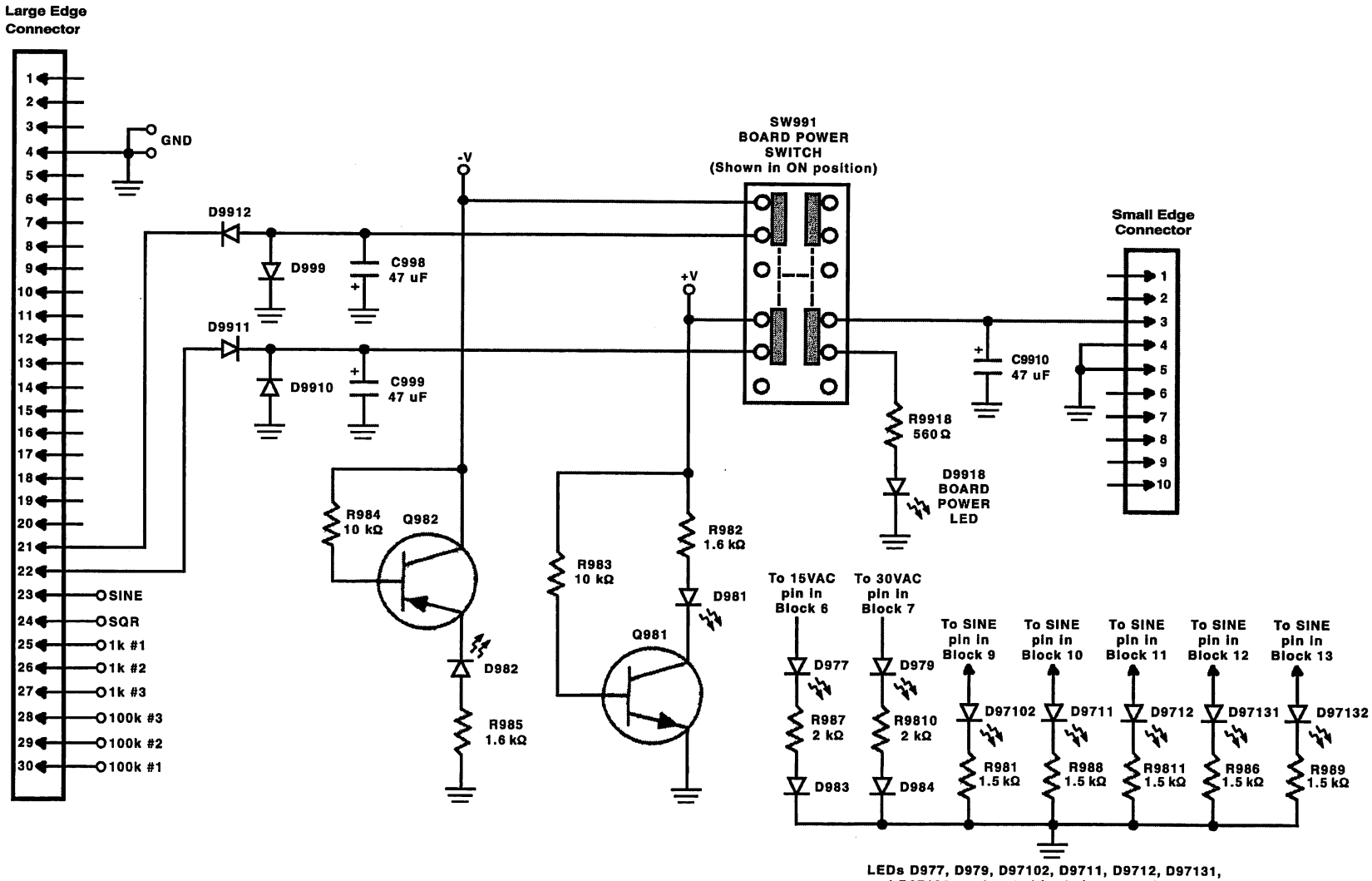
Large Edge Connector
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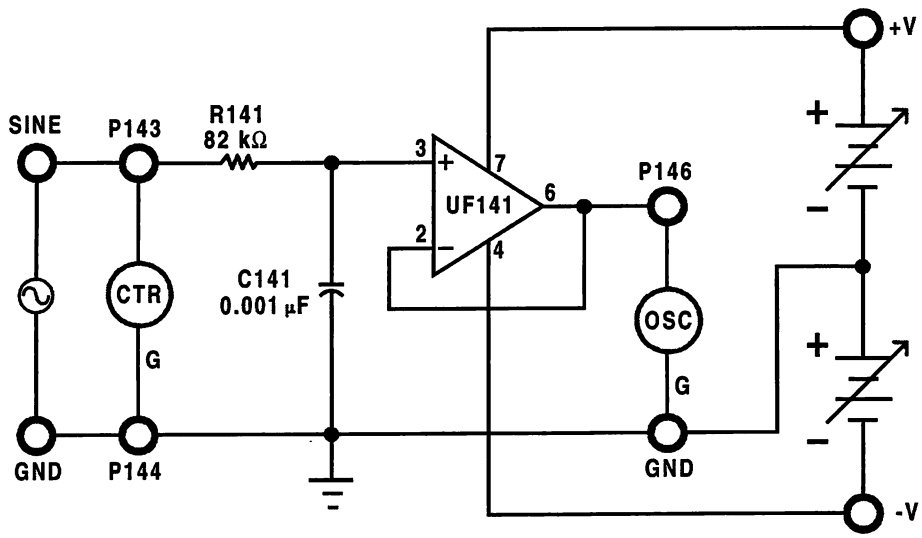
27
28
29
30
GND
SINE
SQR
1k #1
1k #2
1k #3
100k #3
100k #2
100k #1
D9912
D9911
D999
D9910
C998
47 uF
C999
47 uF
-V
+V
SW991
BOARD POWER
SWITCH
(Shown in ON position)
Small Edge Connector
C9910
47 uF
R9918
560Ω
D9918
BOARD
POWER
LED
R984
10 kΩ
Q982
D982
R985
1.6 kΩ
R983
10 kΩ
Q981
R982
1.6 kΩ
D981
To 15VAC pin in Block 6
To 30VAC pin in Block 7
D977
D979
R987
2 kΩ
R9810
2 kΩ
D983
D984
To SINE pin in Block 9
To SINE pin in Block 10
To SINE pin in Block 11
To SINE pin in Block 12
To SINE pin in Block 13
D97102
D9711
D9712
D97131
D97132
R981
1.5 kΩ
R988
1.5 kΩ
R9811
1.5 kΩ
R986
1.5 kΩ
R989
1.5 kΩ
LEDs D977, D979, D97102, D9711, D9712, D97131,
and D97132 are located in their respective blocks.

Exercise Board #2



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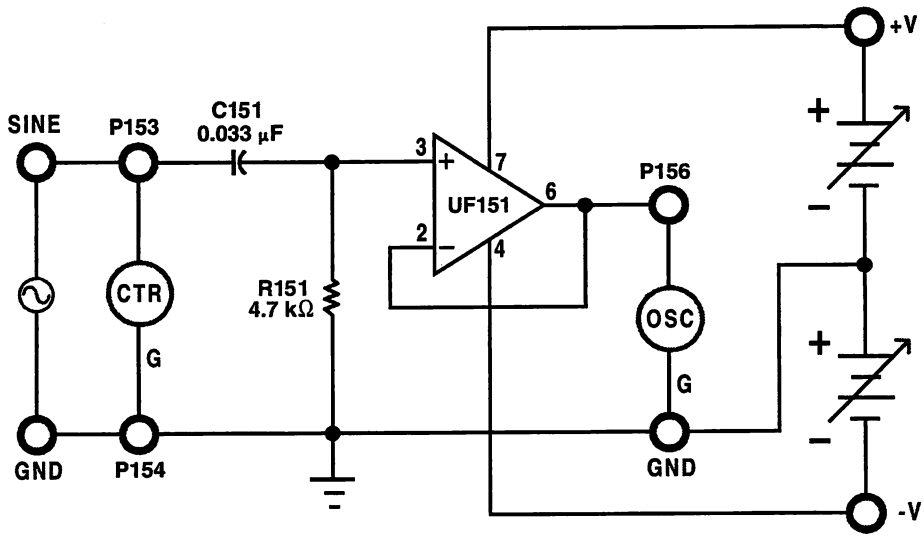

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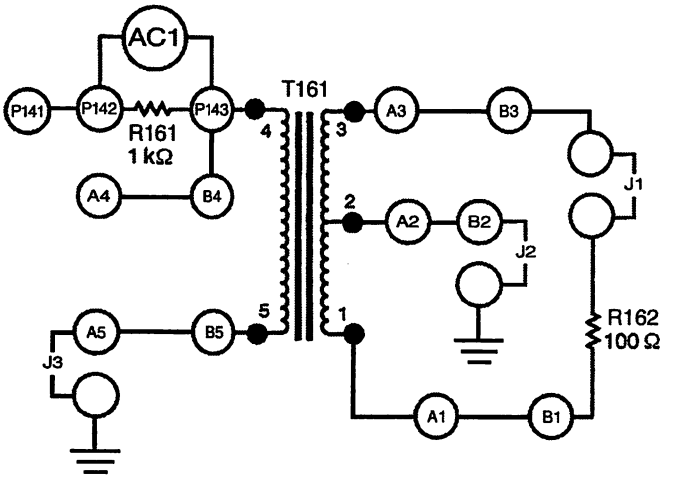

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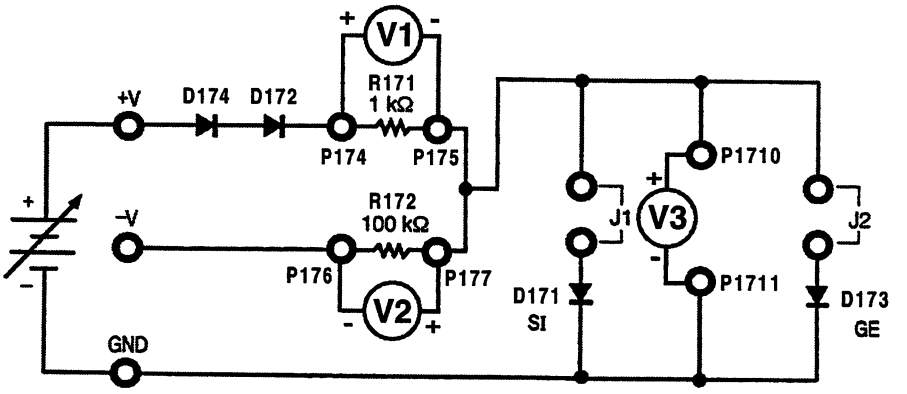

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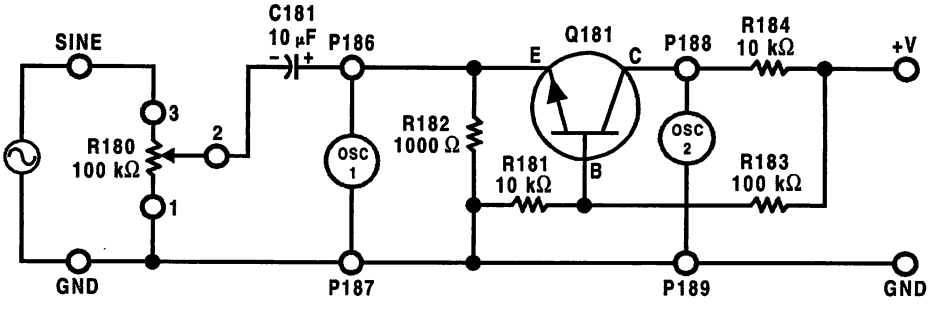

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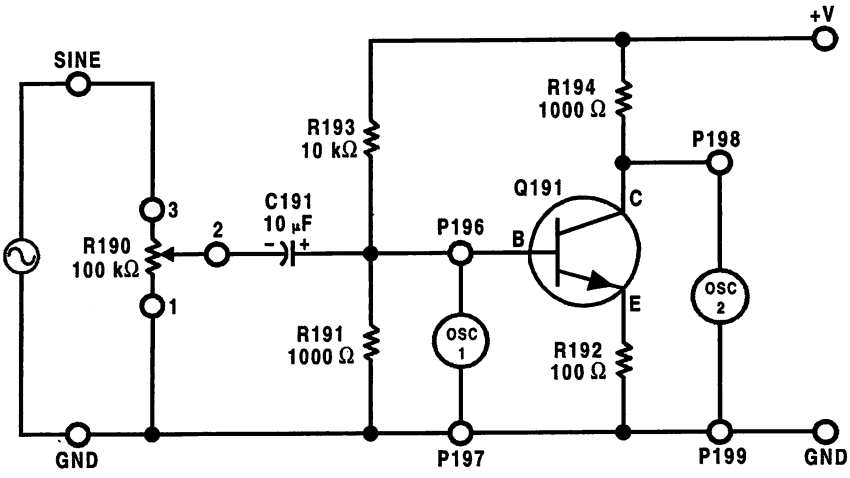

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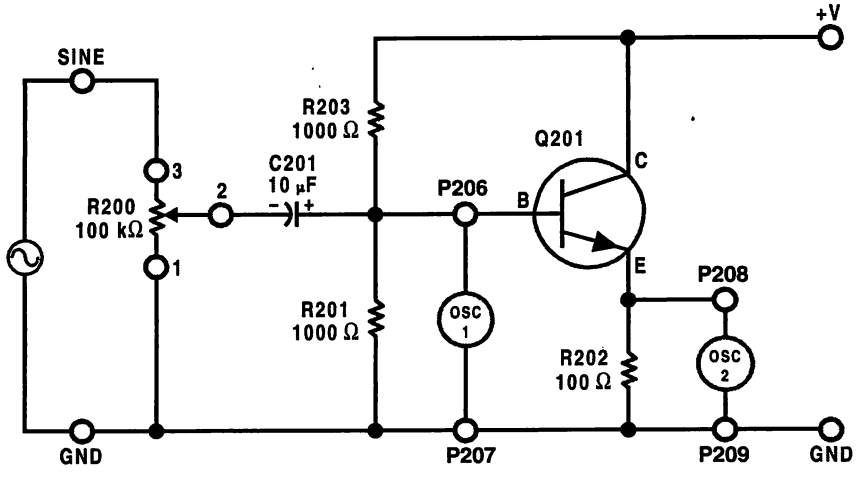

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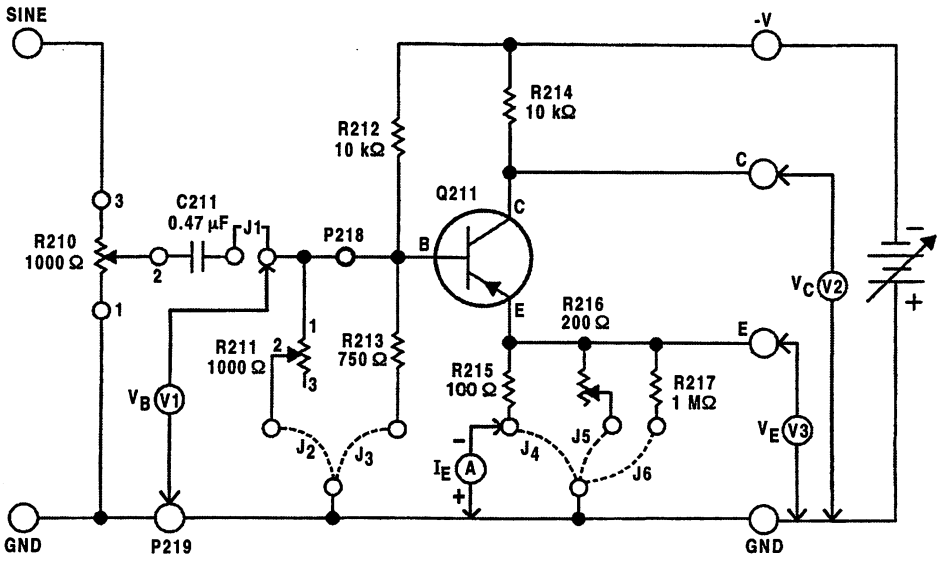

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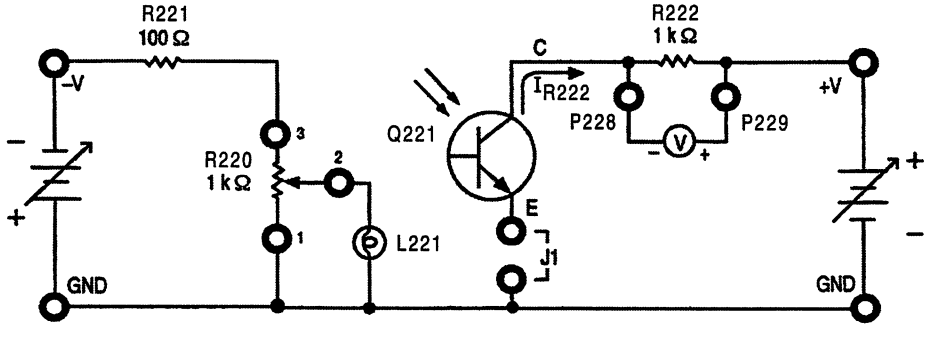

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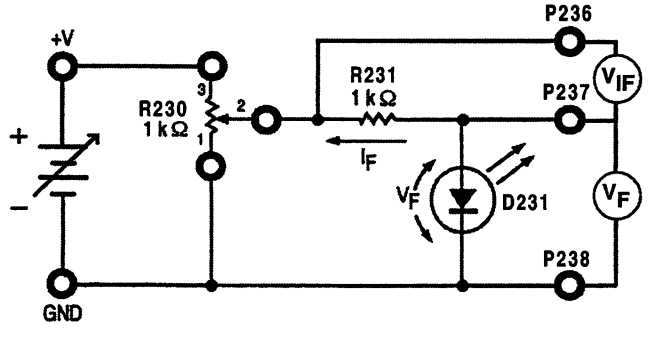

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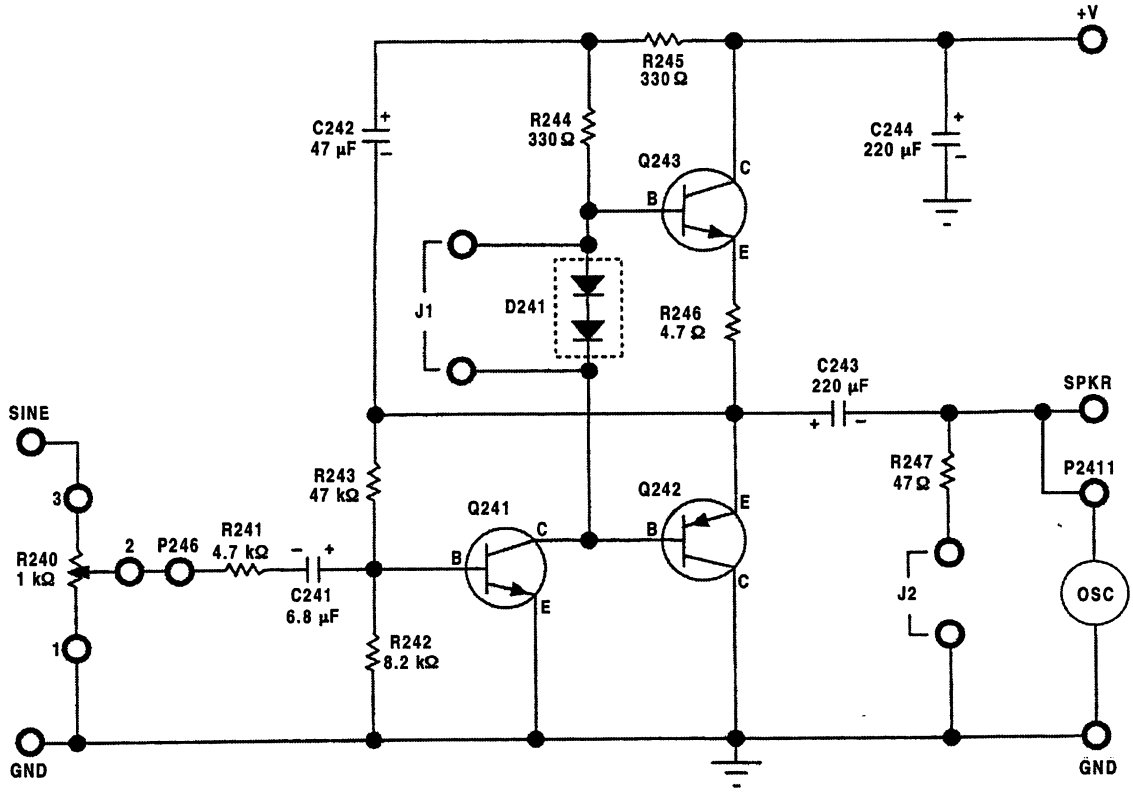

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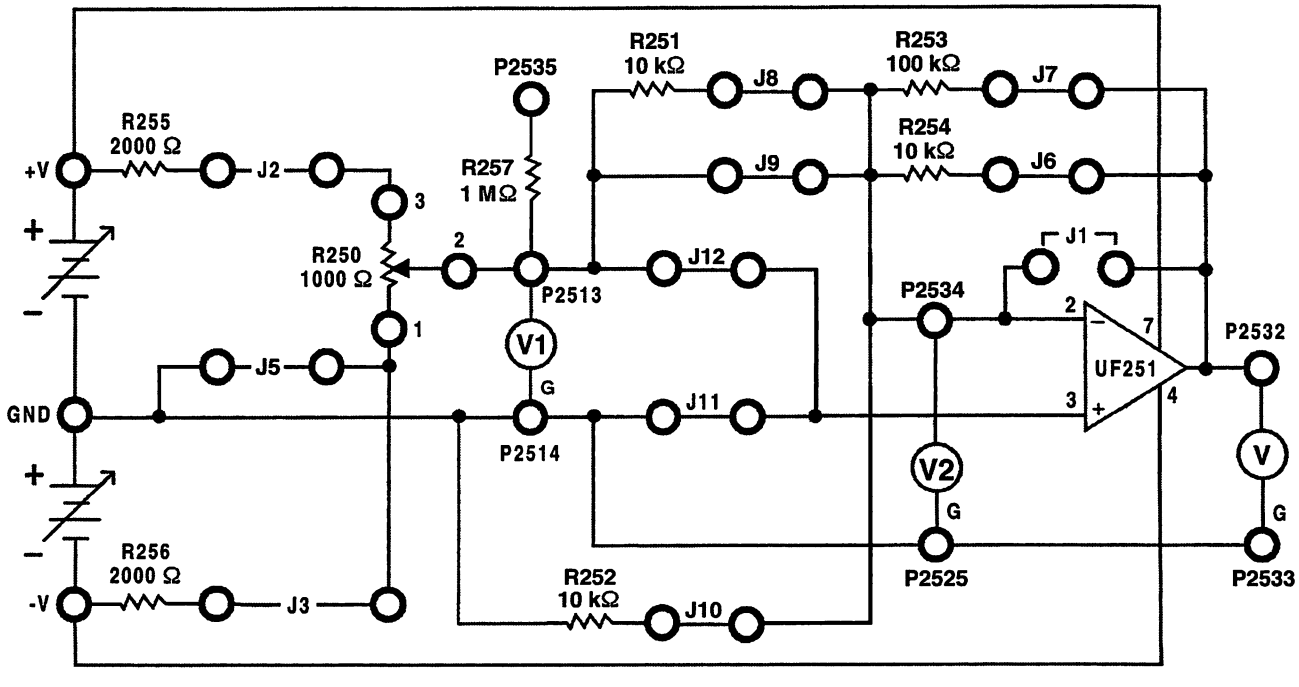

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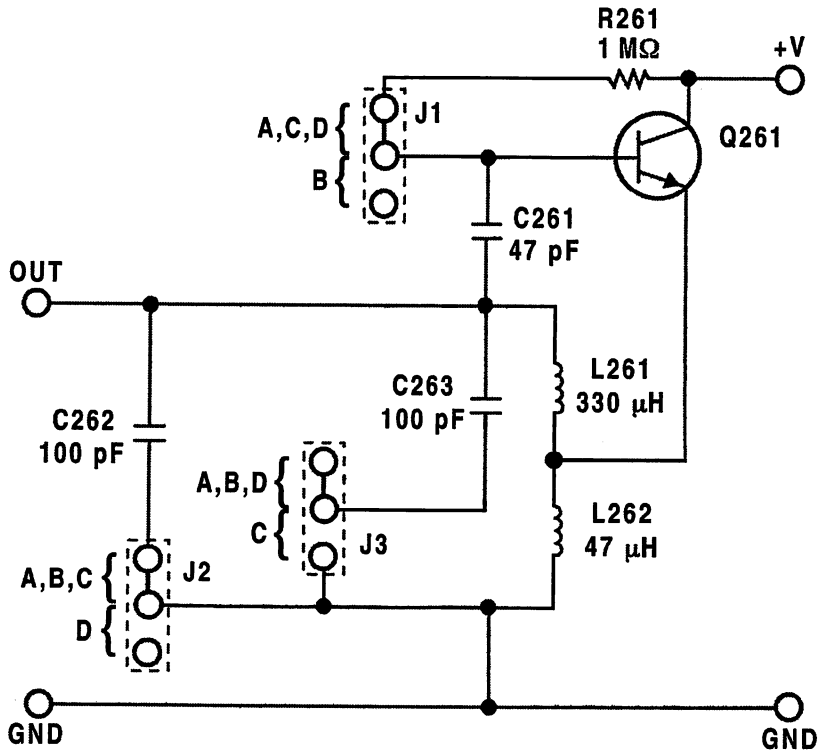
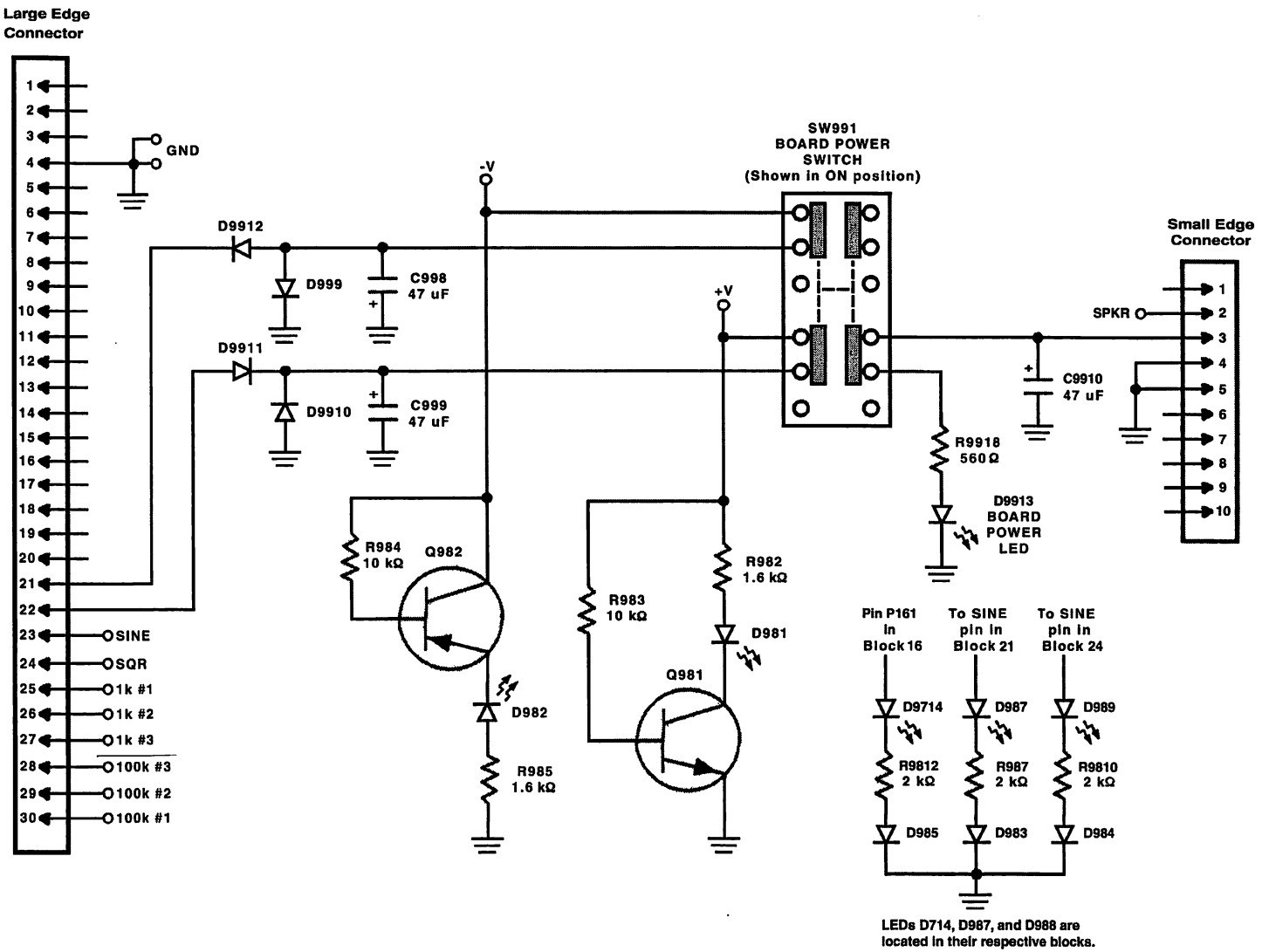

R261
1 MΩ
+V
A,C,D
B
J1
Q261
C261
47 pF
OUT
C263
100 pF
L261
330 µH
C262
100 pF
A,B,D
C
J3
L262
47 µH
A,B,C
D
J2
GND
GND

Block #26


Large Edge Connector
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30
GND
SINE
SQR
1k #1
1k #2
1k #3
100k #3
100k #2
100k #1
D9912
D999
C998
47 uF
D9911
D9910
C999
47 uF
-V
+V
SW991
BOARD POWER
SWITCH
(Shown in ON position)
R984
10 kΩ
Q982
D982
R985
1.6 kΩ
R983
10 kΩ
Q981
R982
1.6 kΩ
D981
R9918
560Ω
D9913
BOARD
POWER
LED
C9910
47 uF
SPKR
Small Edge Connector
1
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3
4
5
6
7
8
9
10
Pin P161 in Block 16
To SINE pin in Block 21
To SINE pin in Block 24
D9714
D987
D989
R9812
2 kΩ
R987
2 kΩ
R9810
2 kΩ
D985
D983
D984
LEDs D714, D987, and D988 are located in their respective blocks.

HEATHKIT
EDUCATIONAL SYSTEMS

Analog Electronics Parts Pack

Model ETB-7101

Your Analog Electronics Parts Pack contains the following items:

Qty.	Part #	Description
1	95-714	Storage case divider set
1	95-713	Storage box
1	134-4118-A0	Set of jumper wires
1	181-9400	Analog Exercise Board #1
1	181-9402	Analog Exercise Board #2
1	347-7	Red test lead
1	347-8	Black test lead
1	595-6113	User's Guide
1	597-7367	Warranty
1	SM-2311-A	Multimeter

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Heathkit Company, Inc.
Benton Harbor, Michigan 49022
597-7399

YOUR HEATHKIT COMPANY PRODUCT
FIVE-YEAR LIMITED WARRANTY

Welcome to the Heathkit family. We are confident you will be pleased with the performance of your Heathkit Company product. Please read this Consumer Protection Plan carefully. It is a "Limited Warranty" and it is extended only to you as owner of this consumer product, as defined by federal law. This limited warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

HEATHKIT COMPANY'S RESPONSIBILITY

LABOR-For a period of five years from the date of purchase, any malfunction caused by defective parts (or defective manufacture) will be corrected at no charge to you. Heathkit Company reserves the right to repair or replace the product, at its option. You must deliver the product at your expense to the Heathkit factory, or your distributor.
REPLACEMENT PARTS- Replacement parts listed in the manual will be supplied free for five years from date of purchase if they are factory defective. Any replacement part will be new or serviceably used, comparable in function and warranted for the remainder of the original warranty or thirty (30) days from date of shipment of the replacement part, whichever is longer. You can obtain warranty parts direct from Heathkit Company by telephoning us at (800) 654-8324 or by contacting your distributor. We will pay shipping charges to get those parts right to you. If your technician decides that you need a replacement part, he or she may require a credit card or other security to ship replacement parts. You must return the defective part within seven (7) days to receive a credit on your replacement parts order. Heathkit reserves the right to require return of the part to be replaced. You may also take advantage of Heathkit's technical consultation service by telephoning us at (800) 654-8324.
NOT COVERED-Adjustments, calibration, and damage due to misuse, abuse, or negligence are not covered by the warranty. Unauthorized service or modification of the product or of any furnished component will void this warranty in its entirety. This warranty does not include reimbursement for inconvenience, loss of use, set-up-time, or unauthorized service. This warranty covers only this Heathkit Company product and is not extended to other equipment or components that a customer uses in conjunction with this Heathkit Company product.

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THIS LIMITED WARRANTY REPLACES, SUPERSEDES, AND TERMINATES ALL IMPLIED WARRANTIES IMPOSED BY OPERATION OF ANY STATE OR FEDERAL LAW WHICH WOULD OTHERWISE EXTEND BEYOND THE ONE YEAR DURATION OF THIS LIMITED WARRANTY. SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

OWNER'S RESPONSIBILITY

EFFECTIVE WARRANTY DATE - Warranty begins on the date of first consumer purchase. You must supply a copy of your proof of purchase when you request warranty service or warranty replacement parts.
OPERATING MANUAL - Read your operating instructions carefully so that you will fully understand the proper operation and function of your product.
INSPECTION OF PRODUCT UPON RECEIPT – You must examine the product and accessories when you receive them. If any item is missing, or you would like to return or exchange a product, you must do so within (30) days from date of purchase. Customer may be charged a restocking fee. If your product arrives damaged, hold the parcel in its original carton and notify the Heathkit Company by telephoning (800) 253-0570 or your distributor within two days.
ACCESSORY EQUIPMENT - Performance malfunctions involving connections to (or interfacing with) other Heathkit Company or non-Heathkit Company equipment are not covered by this warranty and are the owner's responsibility.
SHIPPING UNITS - Damage due to inadequate packing of product being sent back to Heathkit cannot be repaired under warranty. These damages are the responsibility of the customer. Please call the Service Department at (269) 925-3273 for packaging instructions.
WARRANTY SERVICE - We have not established an informal dispute settlement mechanism that is permissible under federal law. However, if you have any questions or problems with this Heathkit product, or for limited warranty service described here, contact your distributor. In addition, you may also write directly to our Director of Customer Service, Heathkit Company, 455 Riverview Drive, Suite 2, Benton Harbor, Michigan, 49022. You may also call us at (800) 253-0570. We will make certain your questions or problems receive immediate, personal attention.

Date: March 2006 597-7367